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10/718,931

11/20/2003

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8021-191 (SS-17862-US)

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EXAMINER

KUMAR, PANKAJ

ART UNIT

PAPER NUMBER

2611

MAIL DATE

DELIVERY MODE

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

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|------------------------------|-------------------------------|-------------------------------|--|
| Office Action Summary | Application No. 10/718,931 | Applicant(s) LEE, KUN-SEOK | |
| | Examiner Pankaj Kumar | Art Unit 2611 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 16 April 2007.
 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-18 is/are pending in the application.
 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
 5) ☒ Claim(s) 9-15 is/are allowed.
 6) ☒ Claim(s) 1, 16 is/are rejected.
 7) ☒ Claim(s) 2-8, 17 and 18 is/are objected to.
 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 a) ☐ All b) ☐ Some * c) ☐ None of:
 1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Arguments

1. Applicant's arguments filed with respect to the rejection(s) of claim(s) under have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made.

Response to Amendment

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1, 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jovenin USPN 6,703,901 in view of Riley USPN 6,236,703.

4. As per claim 1, Jovenin teaches a phase detector for detecting a phase difference between a reference signal and a feedback signal (Jovenin fig. 2, 3: 16); a voltage controlled oscillator for receiving a phase difference control signal based on the detected phase difference, and for oscillating a signal with a frequency based on the detected phase difference (Jovenin fig. 2, 3: 12); a divider for selecting a value from at least three integers according to a predetermined selection signal, for dividing the frequency of the oscillated signal output from the voltage controlled oscillator by the selected value, and for outputting a divided signal as a feedback signal to the phase detector (Jovenin fig. 1, 3: 14, fig. 3: 100); and a sigma-delta modulator for

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adding a predetermined input value to an internal feedback value (Jovenin fig. 3, 4: 30, internal feedback ie from 70a back to 64a), for successively accumulating added values (Jovenin fig. 4: adders), for quantizing an accumulated value to at least three levels (not in Jovenin but would be obvious as explained below), and for converting a quantized value into the predetermined selection signal (Jovenin fig. 3: top output of 30; fig. 4: output of 30; paragraph 16: "The dividing ratios $P-1$, P , $P+1$ and $P+2$ are established in the calculator 40 as a function of the output of the sigma-delta modulator").

5. Jovenin does not teach quantizing an accumulated value to at least three levels. Riley 6236703 teaches quantizing an accumulated value (Riley many elements in many figures including fig. 5: 26 quantizing summed value) to at least three levels (Riley abstract: "quantization of a high resolution digital word to a low resolution digital word with three or a higher odd number of possible output levels"). Also, as per the 3 levels, it has been held that a change in size is generally recognized as being within the level of ordinary skill in the art. In re Rose, 105 USPQ 237 (CCPA 1955). Thus, it would have been obvious to one of ordinary skill in the art at the time of the invention was made to implement the teachings of Riley into Jovenin since Jovenin suggests accumulation (something broad) in general and Riley suggests the beneficial use of quantizing the accumulation to three levels such as to reduce bandwidth with reduced resolution and to keep error minimized with the at least 3 quantization levels (Riley: reduced resolution, error) in the analogous art of delta sigma modulation.

6. As per claim 16, Jovenin teaches a phase detector for detecting a phase difference between a reference signal and a feedback signal; a voltage controlled oscillator for receiving a phase difference control signal based on the detected phase difference, and for outputting a

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signal with a frequency based on the detected phase difference (Jovenin fig. 2, 3: 12); a divider for selecting a value from a plurality of integers according to a predetermined selection signal, for dividing the frequency of the signal output from the voltage controlled oscillator by the selected value, and for outputting a divided signal as a feedback signal to the phase detector (Jovenin fig. 1, 3: 14, fig. 3: 100); and a modulator (Jovenin fig. 3, 4: 30 sigma delta modulator) for adding a predetermined input value to an internal feedback value, for successively accumulating added values (Jovenin fig. 4: adders, internal feedback ie from 70a back to 64a), for quantizing an accumulated value to a plurality of levels (not in Jovenin but would be obvious as explained below), and for converting a quantized value into the predetermined selection signal (Jovenin fig. 3: top output of 30; fig. 4: output of 30; paragraph 16: "The dividing ratios $P-1$, P , $P+1$ and $P+2$ are established in the calculator 40 as a function of the output of the sigma-delta modulator").

7. Jovenin does not teach quantizing an accumulated value to a plurality of levels. Riley 6236703 teaches quantizing an accumulated value (Riley many elements in many figures including fig. 5: 26 quantizing summed value) to a plurality of levels (Riley abstract: "quantization of a high resolution digital word to a low resolution digital word with three or a higher odd number of possible output levels"). Also, as per the plurality of levels, it has been held that a change in size is generally recognized as being within the level of ordinary skill in the art. In re Rose, 105 USPQ 237 (CCPA 1955). Thus, it would have been obvious to one of ordinary skill in the art at the time of the invention was made to implement the teachings of Riley into Jovenin since Jovenin suggests accumulation (something broad) in general and Riley suggests the beneficial use of quantizing the accumulation to a plurality of levels such as to

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reduce bandwidth with reduced resolution and to keep error minimized with the multiple quantization levels (Riley: reduced resolution, error) in the analogous art of delta sigma modulation.

Allowable Subject Matter

8. Claims 2-8, 17-18 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

9. Claims 9-15 are allowed.

10. The following is a statement of reasons for the indication of allowable subject matter: The art of record does not suggest the respective claim combinations together and nor would the respective claim combinations be obvious with:

11. As per claims 9-15: to a fourth order; a quantizer for quantizing an accumulated value output from a last one of the plurality of operation units into a plurality of bits; and a plurality of multipliers for outputting feedback coefficients as internal feedback values to each of the plurality of operation units, wherein the feedback coefficients are determined according to a quantized level corresponding to the plurality of bits

Conclusion

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Pankaj Kumar whose telephone number is (571) 272-3011. The examiner can normally be reached on Monday through Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jay Patel can be reached on (571) 272-2988. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



Pankaj Kumar
Primary Examiner
Art Unit 2611

PK